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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/862,688	05/22/2001	Dieter Mauer	0275M-260DVB	9681
<div>7590 07/26/2007 Monte L. Falcoff Harness, Dickey &amp; Pierce, P.L.C. P.O. Box 828 Bloomfield Hills, MI 48303</div>			<div>EXAMINER OMGBA, ESSAMA</div>	
			<div>ART UNIT 3726</div>	<div>PAPER NUMBER</div>
			<div>MAIL DATE 07/26/2007</div>	<div>DELIVERY MODE PAPER</div>

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

09/862,688

Applicant(s)

MAUER ET AL.

Examiner

Essama Omgba

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-77 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 is/are allowed.
- 6) ☒ Claim(s) 12, 15, 16 and 18-77 is/are rejected.
- 7) ☒ Claim(s) 13, 14 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/5/2005 &amp; 2/9/2006</u>                                   | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. The finality of the last Office action is withdrawn.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 12, 15 and 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Speller, Jr. et al. (US Patent 5,829,115).

With regards to claim 12, Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit 506, an electronic motor connected to the electronic control unit, wherein a force to be applied during the riveting process may be precisely computer-controlled (col. 4, lines 25-39), and the velocity of the electric motor is determined, a sensor 510 connected to the electronic control unit, the sensor operably detecting a riveting characteristic occurring during the riveting process, one of the riveting characteristics being the output shaft location, see column 7, lines 20-67, column 8, lines 1-35 and 49-53, and column 9, lines 4-56. Applicant should note that it is inherent that a sensor would have to be connected to the control unit for the force to be precisely computer-controlled.

For claim 15, see column 5, lines 23-29 and 49-64 of Speller, Jr. et al.

For claims 18-20, see column 4, lines 29-34, column 7, lines 44-54 and column 8, lines 22-27. Applicant should note that the voltage represents an electrical power characteristic of the motor and as pointed out by Speller control of the operation of the motor is well known to those skilled in the art. Also Speller, Jr. et al, relates the applied voltage, the velocity and the torque applied as functions of one another as disclosed. One of ordinary skill in the art would know the number and type of sensors to be used.

For claim 21, see column 7, lines 20-25 of Speller, Jr. et al.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller Jr. et al. in view of Zeldman (US Patent 3,878,734).

Speller, Jr. et al. discloses an electronic control system as shown above except for the transmission including a closed loop belt. However it is known to use closed belt loops in power transmissions as attested by Zeldman et al., see column 3, lines 34-36. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a closed loop belt in the transmission of Speller, Jr. et al./IBEC, in light of the teachings of Zeldman et al., in order to provide a highly power transmission capable of being inexpensively manufactured.

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6. Claims 22-30, 33, 34, 43, 44, 56, 57 and 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. in view of Cotterill (US Patent 5,752,305).

With regards to claims 22-26, 29, 30, 33, 34, 43, 44, 56 and 61, Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit, an electric motor connected to the electronic control unit and sensors connected to the electronic control unit and the electric motor, the sensors indicating various characteristics of the electric motor and various riveting characteristics, the electronic control unit being a programmable computer, see column 2, lines 24-31, column 7, lines 20-23 and 42-54 and column 8, lines 17-35. Speller, Jr. et al. does not disclose the rivet as being a self-piercing rivet operably driven by a punch as controlled by an electrical control unit, and a die operably diverging an end of the rivet without the rivet piercing completely through the exterior surface of a die-side workpiece adjacent the die, the die acting with a substantially relatively stationary die, the rivet being of a hollow and diverging type with a solid head. However Cotterill et al. teaches such rivet, punch and die assembling, see column 2, lines 27-49 and figures 1-3. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated the control system of Speller, Jr. et al. with the rivet and die system of Cotterill et al., in order to improve the riveted joint produced. Applicant should note that it is inherent that

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a data monitoring system is used with the system of Speller, Jr. et al. Also the transmission of Speller, Jr. et al. is always connected to the electric motor when the riveting machine is used.

For claim 27 and 28, Applicant should note that the position of the electric motor is an obvious matter of design choice.

For claim 57, Applicant should note that such system is conventional in the art.

For claim 59, Applicant should note that circulating ball spindle used in a riveting machine transmission is old and well known to those of ordinary skill in the art.

For claim 60, Applicant should note that having the rotational axis of the motor to be offset from an elongated centerline of the plunger is an obvious matter of design choice.

7. Claims 31, 32, 35-42 and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill as applied to claims 22, 34 and 43 above, and further in view of Gast (US Patent 4,901,431).

For claims 31, 32, 41 and 42, Speller, Jr. et al./Cotterill discloses an electronic control system as shown above except for the electrical control unit stopping the riveting process and transmitting an error signal if an undesired condition exists. However such controls are old and well known in the art as attested by Gast, see column 17, lines 24-30 and 57-68 and column 18, lines 1-2. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated such electrical control unit with the system of Speller, Jr. et al./Cotterill, in light of the

teachings of Gast, in order to detect and resolve errors problem during the riveting process.

With regards to claims 35-40, 45 and 46, Speller, Jr. et al./Cotterill et al. discloses an electronic control system as shown above except for a rivet feeder connected to the electronic control unit, a feed tube sensor wherein the rivet size is sensed by the sensor and an articulating robot attached to and positioning the riveting machine. However Gast teaches such rivet feeder and robot, see columns 13 and 14. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated a rivet feeder and an articulating robot to the system of Speller, Jr. et al./Cotterill et al., in light of the teachings of Gast, in order to facilitate transfer of the rivet and enhance the rivet installation process.

For claim 47, the use of an endless belt is an obvious matter of design choice that is equivalent to Speller, Jr. et al.'s reduction gears mechanism.

8. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. in view Gast.

Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit, an electric motor connected to the electronic control unit and sensors connected to the electronic control unit and the electric motor, the sensors indicating various characteristics of the electric motor and various riveting characteristics, the electronic control unit being a programmable computer, wherein a force to be applied during the riveting process may be precisely computer-controlled see column 2, lines 24-31, column 4, lines 25-39,

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column 7, lines 20-23 and 42-54 and column 8, lines 17-35. Speller, Jr. et al. does not disclose a rivet feeder connected to the electronic control unit, a feed tube sensor wherein the rivet size is sensed by the sensor and an articulating robot attached to and positioning the riveting machine. However Gast teaches such rivet feeder and robot, see columns 13 and 14. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated a rivet feeder and an articulating robot to the system of Speller, Jr. et al., in light of the teachings of Gast, in order to facilitate transfer of the rivet and enhance the rivet installation process.

Applicant should note that it is within the general knowledge of one of ordinary skill in the art to use a sensor in monitoring the riveting force.

9. Claims 49 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Gast as applied to claim 48 above, and further in view of Cotterill et al.

For claim 49, Speller, Jr. et al./Gast teaches a control system as shown above except for the rivet having a solid head and a diverging open end which does not completely penetrate a workpiece farthest from the head. However Cotterill et al. teaches such rivet, see figures 1-3. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the rivet of Cotterill et al, in Speller, Jr. et al./IBEC/Gast's control system in order to avoid unevenness in the thickness of the sheet material encapsulating the rivet.



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For claim 55, see column 1, lines 19-35 of Cotterill et al. Applicant should note that it is inherent that the flushness of the rivet would have to be monitored in order to produce unobjectionable surface appearance at the rivet location.

10. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al. as applied to claim 57 above, and further in view of the Affidavit of John Vrana (Vrana).

Speller, Jr. et al./Cotterill et al. discloses a system as shown above except for the plunger and the clamp movable together at a first speed during advancement, and the plunger is subsequently movable at a second speed slower than the first speed when the clamp is substantially stationary during rivet-to-workpiece engagement. However such system is known as attested by Vrana. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the system of Vrana with the system of Speller, Jr. et al./Cotterill et al., in order to ensure good quality joints.

11. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al. as applied to claim 56 above, and further in view of IBEC (Body Assembly & Manufacturing, September 1994) and Gast.

Speller, Jr. et al./Cotterill et al. discloses a system as shown above except for a sensor operable to detect at least one of clamp travel, plunger advancing force, clamp advancing force, etc, and a robotic arm coupled to the frame. However IBEC teaches a monitoring system to monitor the applied force during the riveting process, see pages 4, 5 and 7. Therefore it would have been obvious to one of ordinary skill in the art at the

time the invention was made, to have used the monitoring system of IBEC in Speller, Jr. et al./Cotterill et al.'s electronic control system, in order to achieve superior rivet joints. Applicant should note that using a die always aligned with the punch is an obvious matter of design choice wherein no stated problem is solved or unexpected results obtained in using a die always aligned with the plunger versus the type taught by Speller, Jr. et al. Furthermore many of the prior arts made of record in the instant application disclose the combination of a substantially stationary die always aligned with a punch. Gast on the other hand teaches such robot, see columns 13 and 14. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated an articulating robot to the system of Speller, Jr. et al./Cotterill et al./IBEC, in light of the teachings of Gast, in order to enhance the rivet installation process.

12. Claims 63 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. in view of Cotterill et al. and Vrana.

Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit, an electric motor connected to the electronic control unit and sensors connected to the electronic control unit and the electric motor, the sensors indicating various characteristics of the electric motor and various riveting characteristics, the electronic control unit being a programmable computer, see column 2, lines 24-31, column 7, lines 20-23 and 42-54 and column 8, lines 17-35. Speller, Jr. et al. does not disclose the rivet as being a self-piercing rivet operably driven by a punch, and a die operably diverging an end of the

rivet without the rivet piercing completely through the exterior surface of a die-side workpiece adjacent the die. However Cotterill et al. teaches such rivet, punch and die assembling, see column 2, lines 27-49 and figures 1-3. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated the system of Speller, Jr. et al. with the rivet and die system of Cotterill et al., in order to improve the riveted joint produced. Although Speller, Jr./Cotterill et al. does not disclose a movable clamp connected to the transmission, the movable clamp and a member coupled to the transmission initially movable together at a first speed and the plunger movable at a second speed, however such arrangement is known as attested by Vrana. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the system of Vrana with the system of Speller, Jr. et al./Cotterill et al., in order to ensure good quality joints.

13. Claims 64-70 and 71-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al./Vrana as applied to claim 63 above, and further in view of IBEC.

Speller, Jr. et al., Cotterill et al., Vrana and IBEC have all been discussed above. It is within the general knowledge of one of ordinary skill in the art to use appropriate sensors and monitoring units as outlined in the above rejections.

***Allowable Subject Matter***

14. Claims 1-11 are allowed.

15. Claims 13, 14 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

16. Applicant's arguments filed in the Appeal Brief of February 5, 2007 have been fully considered but they are not persuasive.

In response to Applicant's argument that there is no suggestion or motivation to combine the hydraulically actuated riveting machines such as IBEC with the electric motor actuated device of Speller, Jr. et al. or that there is no suggestion or motivation to combine the electrically driven machine of Speller with the hydraulically actuated machine of the Cotterill reference, the examiner respectfully disagrees. IBEC's control system can be used in systems where the pressing force is generated by Electro-Mechanical, Pneumatic or Hydraulics means (see the third paragraph of page 7). The shows that the claimed control system is not exclusive to electric motor actuated riveting machines. IBEC is used to show that it is known to use electrical control systems to in both electric and hydraulic self-piercing riveting machines. Furthermore Speller, Jr. et al. teaches substituting hydraulic riveting machines with non-hydraulic riveting machines that are controllable throughout the entire fastener upset operation. Therefore whatever control system control system is used in hydraulic systems could be configured for non-hydraulic systems as attested by Speller, Jr. et al., see for example column 1, lines 4-27

and column 2, lines 7-31 and 36-45 of Speller, Jr. et al. The various parameters that are claimed as being controlled are known to be controlled in hydraulic riveting machines.

In response to Applicant's argument that a fluid-free transmission is used in his invention, thus further highlighting the incompatibility and lack of suggestion and motivation to combine the hydraulic system of IBEC with the electric motor actuator of Speller, the examiner again points out that IBEC is directed to both electric and hydraulic riveting devices. The examiner maintains that IBEC is pertinent to the problem Applicant was trying to solve, namely control system in riveting devices. Applicant should note that it has been held that a prior art reference must either be in the field of Applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

In response to Applicant's argument that the examiner has ignored the secondary consideration of commercial success, the examiner respectfully disagrees. The examiner has responded to those arguments in responses in Paper No. 8 mailed July 10, 2002.

In response to Applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does

not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

### ***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Essama Omgba whose telephone number is (571) 272-4532. The examiner can normally be reached on M-F 9-6:30, 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on (571) 272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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A handwritten signature in black ink, appearing to read 'Essama Omgba', written in a cursive style.

Essama Omgba  
Primary Examiner  
Art Unit 3726

eo

June 24, 2007